

# BACHELOR OF SCIENCE IN NUCLEAR AND RADIOLOGICAL ENGINEERING - NUCLEAR ENGINEERING CONCENTRATION

Code	Title	Credit Hours
<b>Wellness Requirement</b>		
APPH 1040	Scientific Foundations of Health	2
	or APPH 10 The Science of Physical Activity and Health	
	or APPH 10 Flourishing: Strategies for Well-being and Resilience	
<b>Core IMPACTS</b>		
<b>Institutional Priority</b>		
CS 1371	Computing for Engineers	3
<b>Mathematics and Quantitative Skills</b>		
MATH 1552	Integral Calculus <sup>1</sup>	4
<b>Political Science and U.S. History</b>		
HIST 2111	The United States to 1877	3
	or HIST 2111 The United States since 1877	
	or INTA 1200 American Government in Comparative Perspective	
	or POL 1101 Government of the United States	
	or PUBP 3000 American Constitutional Issues	
<b>Arts, Humanities, and Ethics</b>		
Any HUM <sup>2</sup>		6
<b>Communicating in Writing</b>		
ENGL 1101	English Composition I	3
ENGL 1102	English Composition II	3
<b>Technology, Mathematics, and Sciences</b>		
PHYS 2211	Principles of Physics I	4
PHYS 2212	Principles of Physics II	4
MATH 1551	Differential Calculus <sup>1</sup>	2
MATH 1553	Introduction to Linear Algebra <sup>1</sup>	2
	or MATH 1553 Linear Algebra	
	or MATH 1553 Linear Algebra with Abstract Vector Spaces	
<b>Social Sciences</b>		
Any SS <sup>2</sup>		9
<b>Field of Study</b>		
CHEM 1310	Principles of General Chemistry for Engineers <sup>4</sup>	4
MATH 2551	Multivariable Calculus <sup>1</sup>	4
MATH 2552	Differential Equations <sup>1</sup>	4
MSE 2001	Principles and Applications of Engineering Materials	3
NRE 2120	Elements of Nuclear and Radiological Engineering	3
<b>Major Requirements</b>		
Economics Requirement <sup>10</sup>		
Ethics Requirement <sup>2</sup>		
NRE 3026	Experimental Nuclear Reactor Physics	3

NRE 3112	Nuclear Radiation Detection	3
NRE 3208	Nuclear Reactor Phys I	3
NRE 3301	Radiation Physics	3
NRE 3316	Radiation Protection Engineering	3
NRE 4350	Design Methods & Tools	3
NRE 4351	Design of Nuclear and Radiological Systems	3
<b>Non-NRE Requirements</b>		
COE 2001	Statics	2
ECE 3710	Circuits and Electronics	2
ECE 3741	Instrumentation and Electronics Lab	1
ISYE 3025	Essentials of Engineering Economy	1
ME 3322	Thermodynamics	3
ME 3340	Fluid Mechanics	3
MATH 3670	Probability and Statistics with Applications	3
	or ECE 3077 Prob/Stats for ECE	
	or ISYE 3775 Statistics and Applications	
<b>Nuclear Energy Concentration requirements <sup>5</sup></b>		
ME 3345	Conduction and Radiation Heat Transfer	3
NRE 4210	Nuclear Reactor Theory	3
NRE 4214	Reactor Engineering	3
Math/Science Elective <sup>6</sup>		3
Engineering Elective <sup>7</sup>		3
<b>Free Electives</b>		
Free Electives (1000-level or higher) <sup>8</sup>		3
Free Electives (2000-level or higher) <sup>9,11</sup>		9
<b>Total Credit Hours</b>		<b>126</b>

No Pass-Fail courses allowed except for Ethics overlay requirement.

Students must earn a minimum Major GPA of 2.0 (truncated). Major GPA includes all required NRE and ME classes plus classes used for the concentration. If a class is repeated, only the last grade is included in the calculation.

<sup>1</sup> Minimum grade C

<sup>2</sup> Ethics Overlay may be Core IMPACTS Arts, Humanities, & Ethics or Social Sciences and can be any course from the GT-approved list: <http://www.catalog.gatech.edu/academics/undergraduate/core-curriculum/ethics/>.

<sup>3</sup> Students can receive credit for only one of ECON 2100, ECON 2101, ECON 2105 and ECON 2106. The only exception is that students can receive 6 hours credit for both ECON 2105 and ECON 2106.

<sup>4</sup> CHEM 1211K can substitute for CHEM 1310. CHEM 1211K and CHEM 1212K are recommended for pre-health students.

<sup>5</sup> Students must satisfy the requirements of EITHER the Nuclear Engineering (NE) Concentration or the Radiological Science and Engineering (RSE) Concentration. NE Concentration requires ME 3345, NRE 4210, and NRE 4214; RSE Concentration requires NRE 4328 and two courses from the following list: NRE 4750, NRE 4803 (Nuclear Safeguards), and NRE 4407. Students may complete both Concentrations using free or engineering electives.

<sup>6</sup> Any Math or Science at 2000 level or higher with the exception of selected 1000-level courses: BIOS 1107/BIOS 1107L, BIOS 1108/BIOS 1108, and CHEM 1212K.

<sup>7</sup> Engineering Elective is any class from the College of Engineering at the 2000-level or higher excluding: ME 3141, ME 3700, ME 3720, ME 3743, ME 3744, ME 4741, ME 4742, and ME 4753. Also excludes

project-type courses such as VIP, and 2699, 2903, 4699, 4903 classes.

Cannot duplicate any other material used to satisfy the BSNRE degree requirements.

- 8 Free 1XXX: Cannot duplicate any other material used to satisfy the BSNRE degree requirements.

- 9 Free 2XXX: At least 9 hours of free electives must be at the 2000 level or above with the exception of 4 hours that may be satisfied with one of the following: BIOS 1107/BIOS 1107L, BIOS 1108/BIOS 1108L, or CHEM 1212K. Cannot duplicate any other material used to satisfy the BSNRE degree requirements

- 10 Engineering students must complete an Economics course. Students should take ECON 2100, ECON 2101, ECON 2105, ECON 2106 to complete this requirement. The course will also satisfy 3 hours of Core IMPACTS Social Science courses.

- 11 Students can use a maximum of 6 credit hours of VIP courses (ECE 2811, 381X, 481X) or a maximum of 6 credit hours of undergraduate research and special problems courses (2699, 4699, 4903 from any department) not to exceed 9 credit hours from both course groups towards the degree requirements for the BSNRE degree.